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Perspectives in Disease Prevention and Health Promotion

A Strategic Plan for the Elimination of Tuberculosis in the United States

In 1987, the Department of Health and Human Services (DHHS) established the Advisory Committee for the Elimination of Tuberculosis (ACET) to "provide recommendations for the development of new technology, application of prevention and control methods, and management of state and local tuberculosis programs targeted toward the elimination of tuberculosis as a public health problem." In response to this charge, the ACET completed a strategic plan for the elimination of tuberculosis (TB) in the United States with advice and consultation from a large number of persons and organizations. The following is a summary of the plan. The complete plan has been published as an *MMWR* supplement (*1*).

The plan urges the establishment of a national goal of TB elimination (an incidence of <1 case per million population) by the year 2010, with an interim target of an incidence of 3.5 cases per 100,000 population by the year 2000. The plan cites three factors that favor the achievement of this goal: 1) TB is retreating into focal geographic areas and demographically well-defined groups; 2) biotechnology can potentially generate better diagnostic, therapeutic, and preventive modalities; and 3) new computer, telecommunications, and other technologies will enhance the transfer of these new biotechnologies into clinical and public health practice. A three-step plan of action is proposed:

Step 1. More effective use of existing prevention and control methods, especially in high-risk populations;
Step 2. The development and evaluation of new technologies for diagnosis, treatment, and prevention; and
Step 3. The rapid assessment and transfer of newly developed technologies into clinical and public health practice.

Current problems cited in the plan include deficiencies in identifying and reporting TB cases and contacts, the failure to fully use prevention interventions, the failure of many patients to complete prescribed therapy, and the failure to adequately assess the effectiveness of community prevention and control programs.

Recommended priorities for action include 1) identifying and screening high-risk population groups within each health jurisdiction and 2) making adequate and

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appropriate treatment and prophylaxis more widely available. Elimination of TB in the United States depends on the identification of groups at high risk for infection and disease. These groups vary through time, by place, and by personal characteristics. In 1987, the identifiable groups at high risk included HIV-infected persons, the homeless, immigrants and refugees from high-prevalence countries, intravenous-drug abusers, and residents of correctional institutions and nursing homes. Blacks, Hispanics, and Native Americans are also at high risk; the higher risk in these minority populations appears to be primarily related to socioeconomic status (*2*). However, because the epidemiology of TB changes, populations now at high risk may decline in risk over time, and groups not currently identified to be at risk may become at risk. Therefore, the plan urges CDC and state and local health departments to continue and to strengthen TB surveillance activities and to further improve their ability to define groups at high risk for TB.

In addition to identifying high-risk populations, health-care providers must extend TB screening, treatment, and prevention programs to these groups. For such programs to be optimally effective, high-risk groups and health-care providers for these groups should be involved in designing, implementing, and promoting these programs.

To increase the proportion of patients who complete therapy, the plan recommends several actions, including the more widespread use of the newer short-course treatment regimens (*3*). In addition, for each new case of TB, a specific health-care provider should be responsible for assuring that patients and their contacts are educated about TB and its treatment, that therapy is continued and completed, and that appropriate contact examination and preventive treatment are conducted. The use of directly observed therapy is strongly encouraged. Quarantine measures, including temporary institutionalization, are recommended only in those rare instances when an infectious patient refuses to comply with self-administered or directly observed therapy.

The implementation of these recommendations will require an increase in the number of health department outreach staff who are members of the populations they serve. During the past few years, this approach has proven successful in public health practice and is more cost-effective than alternative approaches such as long-term hospitalization (CDC, unpublished data).

Intensified use of existing technologies as outlined above is essential in moving the nation toward elimination; however, this strategy alone will not be sufficient to reach the goal. It is crucial that new technologies be developed. The plan points out that recent developments in biotechnology are revolutionizing the diagnosis, treatment, and prevention of other infectious diseases and that, by applying these new techniques to TB, it should be possible to develop the new tools needed to eliminate TB (*4*).

The highest priorities for new technology development are 1) the development of alternative approaches to prevention of disease among persons already infected and 2) the development of a more rapid and effective test for identifying persons infected with living tubercle bacilli. Research efforts directed toward developing a more reliably effective TB vaccine, more rapid and accurate diagnostic tests, and more effective and rapidly-acting drugs are also needed.

Finally, new technologies must be assessed and put into clinical and public health practice in a timely fashion. The plan points out that federal agencies; professional

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societies; and schools of medicine, nursing, and public health all have a role in assessing and implementing new technologies and that both public and private funds will be needed to support demonstration projects for technology assessment and implementation.

Health departments, medical and nursing schools, schools of public health, voluntary agencies, professional societies, and minority advocacy groups share responsibilities for educating health-care providers and high-risk groups about the manifestations, methods of diagnosis, treatment, and prevention of tuberculosis. The plan recommends national, regional, and state conferences for health-care professionals to focus attention on TB and to teach modern approaches to its control and eventual elimination.

The plan suggests that advisory committees be established in the states and major metropolitan areas to develop more specific strategies and tactics for TB elimination in each health jurisdiction and to review progress toward elimination. These reviews should include evaluations of morbidity and mortality data, the adequacy of case reporting and casefinding procedures, and the quality of treatment and prevention activities. Interested constituencies, such as lung associations, minority organizations, and professional societies, should be represented on these advisory committees.

The ACET states that it is bringing this plan to the attention of the medical community and the public to stimulate positive and constructive discussion and action, to increase the level of TB awareness, and to encourage a commitment toward the elimination of TB.

Reported by: Div of Tuberculosis Control, Center for Prevention Svcs, CDC.

Editorial Note: The TB elimination plan developed by the ACET provides a roadmap to guide the TB elimination effort for the next 2 decades. Consequently, the plan is being distributed to a wide variety of public, private, and voluntary groups with the request that they actively join in identifying and supporting steps essential to eliminating this disease within their respective jurisdictions.

Although the occurrence of TB in the United States has declined during the past 35 years, the disease persists as a public health problem in this country. From 1953 through 1987, the number of reported cases decreased from 84,517 to 22,255, and the annual incidence of TB decreased from 53.0 to 9.3 cases per 100,000 population (*5*). The reduction has been substantially greater among whites than among other races; as a result, the proportion of cases occurring in nonwhites has risen from 24% in 1953 to 49% in 1987 (*6*). Today, TB among non-Hispanic whites is predominantly a disease of the elderly; among minorities, it is primarily concentrated in young adults. In 1987, the median age of non-Hispanic whites with TB was 62 years; for minority patients, the median age was 39 years (*6*).

Foreign-born persons constituted 24% of patients in 1987, and the risk among immigrants from Asia is especially high, particularly in the first years after arrival in the United States (*5*). The risk for immigrants serves as a reminder that TB persists as a global health problem of enormous dimension. Throughout the world, approximately 7–9 million new cases are diagnosed each year, and the disease is estimated to cause approximately 3 million deaths annually (*7*). An estimated 2 billion persons in the world have latent tuberculous infection (International Union Against Tuberculosis, Paris, personal communication, 1988), making it one of the most prevalent infections in the world. Through the development of new technology, the TB

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elimination effort in the United States can potentially contribute to the solution of the global TB problem.

In the United States, new cases occur primarily among persons with longstanding *Mycobacterium tuberculosis* infection rather than among persons with recent infection. An estimated 10 million persons have longstanding tuberculous infection (CDC, unpublished data). Major progress toward elimination can be achieved by targeting TB screening and preventive therapy programs toward groups of persons with *M. tuberculosis* infection who are at high risk for developing clinical disease.

To accomplish this objective, health department TB-control programs must be maintained, strengthened, and continually evaluated to assure the most beneficial use of available resources. CDC will continue to assist health departments by providing technical and financial assistance, training and educational resources, and surveillance and epidemiologic assistance and by conducting applied and operational research. CDC will continue to work with advisory groups, other federal agencies, state and local health departments, minority organizations, and other organizations to develop more specific strategies and tactics for implementing the plan.

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Progress in Chronic Disease Prevention

Smoking-Attributable Mortality, Morbidity, and Economic Costs — California, 1985

Cigarette smoking remains the single most important preventable cause of death in the United States and has long been implicated as a major risk factor in a variety of chronic diseases, including heart and cerebrovascular diseases, malignant neoplasms, and respiratory and other diseases (*1*). Smoking is a major health burden and has important economic effects.

To examine the impact of smoking, the California Chronic and Sentinel Disease Surveillance Program (CCSDSP), California Department of Health Services, estimated the health and economic costs associated with this risk factor in California for a single

Smoking — Continued

year (1985). The CCSDSP used smoking-attributable fractions (SAFs) for 24 underlying causes of death (based on U.S. prevalence estimates of current and former smokers and neversmokers and relative risk estimates for these groups) to estimate the number of smoking-attributable deaths in 1985 and the number of years of potential life lost (YPLL) to age 80 (*2*). The CCSDSP also applied these SAFs to 1985 California hospital discharge data to estimate the number of smoking-attributable hospitalizations and their costs. National figures for the ratio of hospital costs to direct costs and the ratio of direct costs to total costs (*3*) were applied to the California hospital data to estimate these cost components for California.

The CCSDSP determined that in 1985 smoking was directly responsible for 1) 31,289 deaths; 2) 310,018 YPLL; 3) 313,065 hospital discharges; 4) $4.1 billion in hospital and other medical-care costs; and 5) more than $7.1 billion in total costs, including heath-care and other costs in the state (*4*). Although 77% of the hospital costs related to smoking were paid for by public funds, only 22% of California's adult population currently smokes (*4*; California Department of Health Services, unpublished data, 1987).

The CCSDSP also constructed a separate mortality category—smoking-attributable mortality (SAM)—by grouping together all the deaths that were directly related to smoking. Smoking directly accounts for a substantial portion of the three major causes of death—heart diseases, malignant neoplasms, and cerebrovascular diseases—in California and the United States and has been demonstrated or suspected to be a risk factor for a wide variety of other causes of death (*1*). Therefore, when SAM in California was classified as a separate category of death, it ranked second for men and third for women after heart diseases and malignant neoplasms due to other risk factors (Table 1).

Smoking was responsible for >50% more deaths than were all the following causes combined: unintentional injuries, including motor vehicle collisions and drug-related deaths; homicides; and suicides. Nearly one of every six deaths in the state is attributable to smoking.

Reported by: GA Kaplan, PhD, WE Wright, PhD, KW Kizer, MD, California Dept of Health Svcs. Office of Surveillance and Analysis, and Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: The CCSDSP has demonstrated that smoking is an important cause of mortality, morbidity, and economic costs in California. The CCSDSP data are supported by patterns demonstrated in other national and state-based studies (*2,3,5–7*); however, specific differences exist among findings in these studies and probably reflect differences in methodologic assumptions, study population and subgroup composition, overall mortality experience, and estimates of life expectancies and smoking prevalences.

In an attempt to capture morbidity and related costs, CCSDSP has also applied SAFs to estimate the number of hospital discharges for persons with smoking-attributable illnesses. They have adopted the working assumption that SAFs derived from the cohort studies investigating smoking-related mortality may be useful surrogates for hospital discharge SAFs (the latter not being available from other studies). Although some of the methodologic issues of estimating discharges of persons hospitalized for smoking-attributable illnesses require further consideration, CCSDSP's results suggest that hospital discharges for persons with smoking-related illnesses represent a large health and financial burden for the state.

Smoking -- Continued

CCSDSP's findings may underestimate actual smoking-related mortality, morbidity, and associated costs. Its results are based on relative risk estimates from prospective studies completed within the past several decades rather than on estimates extrapolated from more recent or ongoing studies (*1*). More recent studies have yielded substantially higher relative risk estimates for several smoking-related diseases than did the earlier studies, especially for women. The earlier studies also lacked stable estimates for several diseases currently presumed to be related to smoking. Similarly, deaths from smoking-caused fires and other injury-related deaths have not been considered. Finally, although recent evidence shows an increased risk for lung cancer and respiratory diseases in nonsmokers due to involuntary (passive) smoking (*1*), lack of statewide data to estimate involuntary smoking exposures makes determination of smoking-related deaths in such persons difficult.

By grouping SAM from all causes into one category, CCSDSP has demonstrated that SAM actually ranks among the top three categories of death (after subtracting smoking-related deaths from the other causes). As a separate mortality category, SAM is the second leading cause of death for men and the third for women. However, unlike other categories of death (e.g., cerebrovascular diseases), the SAM category is unique because eliminating one risk factor—smoking—would eventually eliminate all deaths in this category (i.e., almost one of every six deaths in California).

TABLE 1. Deaths from selected causes, including smoking, by sex -- California, 1985

Underlying cause of death*	Men		Women		Total	
	No.	(%)	No.	(%)	No.	(%)
Diseases of the heart†	30,475	(28.6)	30,799	(32.3)	61,274	(30.4)
Malignant neoplasms†	15,953	(15.0)	17,632	(18.5)	33,585	(16.6)
Smoking-attributable mortality§	**19,627**	**(18.4)**	**11,662**	**(12.2)**	**31,289**	**(15.5)**
Cerebrovascular diseases†	5,330	(5.0)	8,035	(8.4)	13,365	(6.6)
Unintentional injuries	7,299	(6.9)	3,081	(3.2)	10,380	(5.1)
(motor vehicles)	(3,781)	[3.6]	(1,515)	[1.6]	(5,296)	[2.6]
Pneumonia and influenza†	2,977	(2.8)	3,912	(4.1)	6,889	(3.4)
Chronic liver disease and cirrhosis	2,558	(2.4)	1,407	(1.5)	3,965	(2.0)
Suicide	2,878	(2.7)	904	(0.9)	3,782	(1.9)
Diabetes mellitus	1,335	(1.2)	1,662	(1.7)	2,997	(1.5)
Homicide	2,170	(2.0)	648	(0.7)	2,818	(1.4)
Chronic obstructive pulmonary disease†	960	(0.9)	1,407	(1.5)	2,367	(1.2)
All other causes†	14,806	(13.9)	14,298	(15.0)	29,104	(14.4)

*Deaths are for all ages.
†Excludes smoking-attributable deaths.
§Includes smoking-attributable deaths from diseases of the heart, malignant neoplasms, cerebrovascular diseases, pneumonia and influenza, and chronic obstructive pulmonary disease.
Source: California Chronic and Sentinel Disease Surveillance Program, California Department of Health Services.

Smoking — Continued

Calculation of the impact of smoking and associated diseases on the health and economic status of a state can be used to guide prevention efforts and intervention strategies. In November 1988, a unique opportunity to support prevention of smoking-related morbidity and mortality in California emerged in the form of a proposition to increase the excise tax on cigarettes sold in the state by 25¢ per pack. Because increasing the price of cigarettes decreases smoking—especially among adolescents (*1*)—sponsors of the proposition sought both to decrease smoking and generate revenues for potential use in smoking prevention and health promotion efforts.

This tax increase on cigarettes was approved by a majority (58%) of the California voters and became effective January 1, 1989. The $650 million in expected revenue per year will be allocated, subject to concurrence by the California legislature, for the following: health education and stop-smoking campaigns especially directed at children, research into tobacco-related diseases, reimbursing hospitals and physicians for uncompensated care (including tobacco-related illnesses), and other areas of research and prevention. An intervention against tobacco use of this magnitude is unique and represents an important opportunity to demonstrate the impact of such a commitment of resources to the antismoking campaign.

CDC is collaborating with state health departments to establish surveillance systems for chronic diseases. Goals of these systems are to estimate the occurrence of these diseases, the prevalences of associated risk factors in the population, and related medical and economic costs. By using surveillance information to guide prevention efforts, public health departments can assist residents of their states in promoting health and preventing chronic disease morbidity and mortality.

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Hospitalization Rates for Ischemic Heart Disease — United States, 1970–1986

Ischemic heart disease (IHD) is the leading cause of death in the United States. Of all chronic diseases, it contributes the most to the health-care burden, including hospitalizations (*1*). This report describes national trends in hospitalization rates by sex from 1970 through 1986 for IHD and its component diagnoses.

Ischemic Heart Disease — Continued

The annual number of hospitalizations was determined from the first-listed diagnosis in the National Hospital Discharge Survey (NHDS) (*2*) of CDC's National Center for Health Statistics (NCHS).* NCHS obtains these data from a multistage, stratified cluster sample of nonfederal short-stay hospitals in the 50 states and the District of Columbia. The NHDS collects approximately 200,000 records per year. Each year, 8800–11,600 patients in the sample were hospitalized with a first-listed diagnosis of IHD. Population estimates were determined from data provided by the Bureau of the Census (*5*) and Demo-Detail† (*6*).

The general category of IHD includes all hospitalized persons with a first-listed diagnosis of 410 through 414 under both ICDA-8 and ICD-9-CM (*3,4*). This grouping

*Diagnoses for 1970–1978 are based on the *International Classification of Diseases (ICD), Eighth Revision, Adapted* (ICDA-8) (*3*); those for 1979–1986, on the *ICD, Ninth Revision, Clinical Modification* (ICD-9-CM) (*4*).

†This file contains midyear estimates of the population by race, sex, and age for 1980–1986. Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

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TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	16th Week Ending			Cumulative, 16th Week Ending		
	April 22, 1989	April 23, 1988	Median 1984-1988	April 22, 1989	April 23, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	1,223	U*	279	10,594	9,640	3,870
Aseptic meningitis	67	82	78	1,184	1,247	1,247
Encephalitis: Primary (arthropod-borne & unspec)	12	12	12	185	210	255
Post-infectious	2	1	2	23	27	29
Gonorrhea: Civilian	11,959	12,371	15,632	197,388	204,927	249,112
Military	164	235	342	3,373	3,817	5,365
Hepatitis: Type A	601	370	423	10,182	7,656	6,916
Type B	360	479	493	6,205	6,484	7,526
Non A, Non B	50	41	73	699	789	1,039
Unspecified	33	52	92	753	659	1,434
Legionellosis	18	14	11	262	257	194
Leprosy	1	4	4	42	54	63
Malaria	15	19	16	298	214	210
Measles: Total†	253	46	113	2,856	718	882
Indigenous	241	43	79	2,673	620	776
Imported	12	3	12	183	98	106
Meningococcal infections	73	77	68	1,082	1,160	1,115
Mumps	162	106	93	1,721	1,713	1,291
Pertussis	25	15	33	515	704	651
Rubella (German measles)	4	3	7	85	65	122
Syphilis (Primary & Secondary): Civilian	659	728	552	12,233	11,333	8,704
Military	-	3	3	91	63	63
Toxic Shock syndrome	6	6	11	101	100	110
Tuberculosis	414	376	430	5,641	5,596	5,852
Tularemia	1	2	1	14	28	26
Typhoid Fever	8	5	5	117	105	87
Typhus fever, tick-borne (RMSF)	2	2	4	26	21	22
Rabies, animal	115	91	115	1,288	1,160	1,466

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis (Hawaii 1)	36
Botulism: Foodborne	6	Plague	-
Infant	3	Poliomyelitis, Paralytic	-
Other	3	Psittacosis (Ga. 1)	31
Brucellosis (Mich. 2, Okla. 1, Nev. 1)	11	Rabies, human	-
Cholera	-	Tetanus (Ga. 1)	14
Congenital rubella syndrome	1	Trichinosis (Hawaii 1)	9
Congenital syphilis, ages <1 year	-		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Twelve of the 253 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending April 22, 1989 and April 23, 1988 (16th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	10,594	1,184	185	23	197,388	204,927	10,182	6,205	699	753	262	42
NEW ENGLAND	469	49	4	1	5,565	6,182	213	344	31	30	20	3
Maine	24	2	1	-	86	147	4	15	3	1	3	-
N.H.	10	1	-	-	58	100	27	21	6	3	-	-
Vt.	4	-	-	-	24	49	9	24	3	-	-	-
Mass.	262	21	1	1	2,108	2,189	77	203	12	20	12	3
R.I.	22	17	-	-	474	550	5	30	2	2	5	-
Conn.	147	8	2	-	2,815	3,147	91	51	5	4	-	-
MID. ATLANTIC	3,275	177	35	2	28,499	32,490	1,437	991	70	87	72	3
Upstate N.Y.	435	72	9	1	5,038	3,939	347	234	25	3	23	1
N.Y. City	1,684	25	2	1	12,137	16,000	111	302	13	69	8	-
N.J.	764	-	24	-	4,385	4,481	146	181	11	5	8	1
Pa.	388	80	-	-	6,939	9,070	833	274	21	10	33	1
E.N. CENTRAL	820	162	59	-	34,634	32,612	568	711	69	26	70	1
Ohio	143	48	15	-	9,238	7,586	123	179	11	3	42	-
Ind.	169	47	19	-	2,265	2,514	35	122	9	8	13	1
Ill.	326	4	2	-	10,723	9,233	253	94	13	8	-	-
Mich.	151	53	18	-	9,974	10,515	110	224	24	7	11	-
Wis.	31	10	5	-	2,434	2,764	47	92	12	-	4	-
W.N. CENTRAL	213	46	5	2	6,798	8,062	311	233	21	3	6	1
Minn.	56	5	-	1	894	1,116	29	39	3	2	2	-
Iowa	24	8	2	-	666	592	26	14	4	-	2	-
Mo.	108	15	-	-	5,333	4,571	178	154	9	1	-	-
N. Dak.	3	3	1	-	39	61	3	8	2	-	-	-
S. Dak.	3	3	1	-	84	173	2	3	3	-	-	-
Nebr.	8	3	1	-	502	471	46	10	-	-	2	1
Kans.	11	9	-	1	1,280	1,078	27	5	-	-	-	-
S. ATLANTIC	2,153	266	24	4	55,838	56,842	804	1,285	100	110	33	-
Del.	34	8	1	-	932	834	18	47	-	1	3	-
Md.	239	29	4	-	6,464	6,007	186	230	12	13	10	-
D.C.	157	5	-	-	3,527	3,792	2	6	1	-	-	-
Va.	204	57	12	-	4,884	4,065	60	92	17	57	1	-
W. Va.	13	2	3	-	431	506	8	25	2	1	-	-
N.C.	156	34	-	1	8,068	8,628	155	341	36	-	8	-
S.C.	85	8	-	-	5,048	4,157	13	151	3	5	2	-
Ga.	298	21	1	-	10,885	11,067	119	130	7	4	3	-
Fla.	967	102	3	3	15,799	17,786	243	263	22	29	6	-
E.S. CENTRAL	270	121	12	1	16,812	15,705	95	433	54	1	6	-
Ky.	42	32	3	1	1,534	1,266	44	121	19	-	1	-
Tenn.	94	15	-	-	5,532	5,209	21	232	14	-	3	-
Ala.	69	59	9	-	5,469	5,434	23	74	20	1	2	-
Miss.	65	15	-	-	4,277	3,796	7	6	1	-	-	-
W.S. CENTRAL	981	75	18	1	21,204	23,319	1,163	556	45	180	16	9
Ark.	24	3	-	-	1,966	2,099	68	24	2	2	1	-
La.	145	8	1	-	4,452	5,072	82	83	5	1	4	-
Okla.	50	13	6	-	1,955	2,063	137	59	8	8	8	-
Tex.	762	51	11	1	12,831	14,085	876	390	30	169	3	9
MOUNTAIN	295	42	6	1	3,991	4,215	1,538	398	78	65	15	1
Mont.	1	-	-	-	59	126	13	14	1	-	2	1
Idaho	8	-	-	-	70	119	64	27	5	2	-	-
Wyo.	6	-	-	-	40	72	7	1	-	-	-	-
Colo.	111	13	1	1	843	1,001	228	68	27	33	2	-
N. Mex.	23	4	-	-	426	415	184	65	17	1	-	-
Ariz.	61	20	2	-	1,477	1,404	815	134	14	25	7	-
Utah	16	4	1	-	148	208	97	27	9	3	3	-
Nev.	69	1	2	-	928	870	130	52	5	1	1	-
PACIFIC	2,118	246	22	11	22,047	25,500	4,053	1,264	231	251	24	24
Wash.	197	-	-	-	1,908	2,136	850	220	60	11	2	1
Oreg.	71	-	-	-	867	918	690	124	29	6	1	-
Calif.	1,821	229	19	11	18,839	21,860	2,136	902	137	230	19	19
Alaska	4	-	2	-	288	345	336	16	5	2	1	-
Hawaii	25	17	1	-	145	241	41	2	-	2	1	4
Guam	-	-	-	-	-	45	-	-	-	-	-	-
P.R.	494	33	1	-	268	475	30	71	5	7	-	4
V.I.	15	-	-	-	177	116	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	19	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	16	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 22, 1989 and April 23, 1988 (16th Week)

Reporting Area	Malaria	Measles (Rubeola)					Meningococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988
UNITED STATES	296	241	2,673	12	183	718	1,082	162	1,721	25	515	704	4	85	65
NEW ENGLAND	17	-	22	-	5	45	83	1	13	-	15	76	-	-	-
Maine	-	-	-	-	-	-	11	-	-	-	4	11	-	-	-
N.H.	1	-	1	-	-	43	10	1	10	-	5	21	-	-	-
Vt.	-	-	1	-	-	-	5	-	-	-	2	1	-	-	-
Mass.	11	-	-	-	3	1	37	-	2	-	-	33	-	-	-
R.I.	3	-	18	-	2	-	1	-	-	-	2	1	-	-	-
Conn.	2	-	2	-	-	1	19	-	1	-	2	9	-	-	-
MID. ATLANTIC	46	16	108	5	86	186	149	6	59	3	40	21	-	2	5
Upstate N.Y.	8	3	8	415	72	2	41	3	20	3	21	8	-	1	1
N.Y. City	15	1	21	-	13	18	20	2	5	-	1	1	-	1	2
N.J.	9	-	58	-	-	-	33	-	11	-	14	2	-	-	1
Pa.	14	12	21	15	1	166	55	1	23	-	4	10	-	-	1
E.N. CENTRAL	15	129	446	-	38	49	114	10	154	1	27	81	-	7	20
Ohio	6	104	287	-	35	3	59	-	8	-	1	16	-	2	-
Ind.	2	-	-	-	-	-	15	3	18	1	11	36	-	-	-
Ill.	4	25	159	-	-	33	13	4	56	-	-	3	-	4	16
Mich.	1	-	-	-	1	13	20	3	59	-	8	13	-	-	4
Wis.	2	-	-	-	2	-	7	-	13	-	7	11	-	1	-
W.N. CENTRAL	7	14	167	-	1	-	28	13	245	1	15	34	-	1	-
Minn.	5	-	-	-	-	-	6	-	-	-	-	5	-	-	-
Iowa	-	-	-	-	-	-	-	-	10	-	6	14	-	-	-
Mo.	1	-	132	-	-	-	7	2	35	1	7	5	-	1	-
N. Dak.	1	-	-	-	-	-	-	-	-	-	-	6	-	-	-
S. Dak.	-	-	-	-	-	-	4	-	-	-	1	2	-	-	-
Nebr.	-	-	-	-	-	-	9	-	2	-	-	-	-	-	-
Kans.	-	14	35	-	1	-	2	11	198	-	1	2	-	-	-
S. ATLANTIC	57	28	164	2	12	155	177	24	274	7	51	64	-	2	1
Del.	1	-	-	-	-	-	1	-	-	-	-	3	-	-	-
Md.	13	-	5	15	6	3	29	10	151	1	5	12	-	1	-
D.C.	3	-	-	-	2	-	8	3	48	-	-	-	-	-	-
Va.	8	-	-	15	1	54	21	10	43	-	3	9	-	-	-
W. Va.	1	-	-	-	-	6	8	-	7	1	9	-	-	-	-
N.C.	9	25	143	-	-	1	25	-	7	-	13	22	-	-	-
S.C.	1	-	-	-	-	-	13	-	7	-	-	-	-	-	-
Ga.	3	-	-	-	-	-	29	-	1	-	4	13	-	-	-
Fla.	18	3	16	-	3	91	43	1	10	5	17	5	-	1	1
E.S. CENTRAL	3	1	4	-	-	7	31	3	68	3	26	11	-	1	-
Ky.	-	1	2	-	-	-	19	-	9	1	1	-	-	-	-
Tenn.	-	-	1	-	-	-	2	2	21	-	8	7	-	1	-
Ala.	2	-	1	-	-	-	8	-	5	2	17	2	-	-	-
Miss.	1	-	-	-	-	7	2	N	N	-	-	2	-	-	-
W.S. CENTRAL	15	50	1,447	2	21	9	83	92	679	2	20	29	2	11	3
Ark.	-	-	-	-	-	-	3	3	67	2	8	5	-	-	2
La.	1	2	6	-	-	-	19	37	224	-	4	2	2	5	-
Okla.	1	-	23	-	-	8	7	14	140	-	8	22	-	1	1
Tex.	13	48	1,418	21	21	1	54	38	248	-	-	-	-	5	-
MOUNTAIN	12	3	16	3	13	109	33	4	70	3	244	266	-	2	2
Mont.	-	-	12	-	1	-	1	-	2	-	-	1	-	1	-
Idaho	2	-	-	-	1	-	-	-	6	1	27	216	-	-	-
Wyo.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Colo.	1	3	3	-	1	109	12	-	5	-	17	6	-	-	1
N. Mex.	1	-	-	35	10	-	1	N	N	-	4	2	-	-	-
Ariz.	4	-	1	-	-	-	17	4	50	2	190	18	-	-	-
Utah	-	-	-	-	-	-	2	-	3	-	5	21	-	-	-
Nev.	3	-	-	-	-	-	-	-	4	-	1	1	-	1	1
PACIFIC	126	-	299	-	7	156	384	9	159	5	77	122	2	59	34
Wash.	5	-	-	-	1	-	35	2	13	1	16	26	-	-	-
Oreg.	7	-	-	-	-	1	31	N	N	2	4	1	-	-	-
Calif.	112	-	298	-	3	153	315	7	140	2	55	72	2	46	30
Alaska	2	-	-	-	-	-	2	-	-	-	-	3	-	-	-
Hawaii	-	-	1	-	3	2	1	-	6	-	2	20	-	14	4
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	1
P.R.	-	U	218	U	-	109	2	U	1	U	2	5	U	3	-
V.I.	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 22, 1989 and April 23, 1988 (16th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	12,233	11,333	101	5,641	5,596	14	117	26	1,288
NEW ENGLAND	478	315	2	124	109	-	10	-	1
Maine	3	5	2	3	3	-	-	-	-
N.H.	1	3	-	4	-	-	-	-	-
Vt.	-	-	-	1	-	-	-	-	-
Mass.	150	130	-	84	71	-	5	-	-
R.I.	11	11	-	18	9	-	4	-	-
Conn.	313	166	-	34	26	-	1	-	1
MID. ATLANTIC	2,554	2,272	18	1,183	1,059	1	32	4	172
Upstate N.Y.	240	146	2	81	175	-	3	2	2
N.Y. City	1,282	1,514	2	709	497	-	21	-	-
N.J.	409	252	5	181	184	-	6	-	-
Pa.	613	360	9	212	203	1	2	2	170
E.N. CENTRAL	461	353	16	652	666	1	13	2	22
Ohio	30	34	7	111	120	-	2	1	-
Ind.	17	18	4	52	74	-	1	1	2
Ill.	212	192	-	290	270	-	6	-	3
Mich.	183	98	5	170	164	-	3	-	3
Wis.	19	11	-	29	38	1	1	-	14
W.N. CENTRAL	101	67	20	167	159	3	4	1	137
Minn.	7	6	5	39	29	-	1	-	40
Iowa	13	8	3	27	13	-	2	1	13
Mo.	45	39	3	60	76	3	1	-	15
N. Dak.	1	1	-	6	4	-	-	-	10
S. Dak.	-	-	3	9	15	-	-	-	32
Nebr.	15	7	5	6	4	-	-	-	11
Kans.	20	6	1	20	18	-	-	-	16
S. ATLANTIC	4,478	4,023	10	1,208	1,282	1	8	13	418
Del.	52	49	-	7	15	-	1	-	10
Md.	237	214	-	91	121	-	1	1	99
D.C.	274	181	-	53	60	-	2	-	2
Va.	170	135	1	118	125	1	1	-	87
W. Va.	4	1	-	29	31	-	-	-	24
N.C.	275	243	4	115	98	-	2	11	-
S.C.	224	199	2	123	126	-	-	1	72
Ga.	964	657	2	177	201	-	-	-	69
Fla.	2,278	2,344	1	495	495	-	1	-	55
E.S. CENTRAL	773	581	1	470	444	1	1	3	124
Ky.	18	20	-	130	126	1	1	3	61
Tenn.	279	198	-	96	100	-	-	-	32
Ala.	289	194	1	156	143	-	-	-	31
Miss.	187	169	-	88	75	-	-	-	-
W.S. CENTRAL	1,576	1,223	6	621	675	4	6	1	227
Ark.	103	58	-	80	66	2	-	-	32
La.	354	231	-	61	105	-	1	-	-
Okla.	25	49	4	57	66	2	-	1	31
Tex.	1,094	885	2	423	438	-	5	-	164
MOUNTAIN	217	199	8	139	129	1	1	1	50
Mont.	-	2	-	4	-	-	-	-	27
Idaho	-	-	1	4	-	-	-	-	-
Wyo.	1	-	-	-	1	-	-	-	11
Colo.	40	30	-	2	20	1	-	1	-
N. Mex.	7	17	1	27	33	-	-	-	9
Ariz.	63	56	5	66	58	-	1	-	2
Utah	8	7	-	17	-	-	-	-	-
Nev.	98	87	1	19	17	-	-	-	1
PACIFIC	1,595	2,300	20	1,077	1,073	2	42	1	137
Wash.	91	73	1	62	64	-	-	-	-
Oreg.	95	90	-	39	40	-	-	1	-
Calif.	1,401	2,122	18	910	908	2	40	-	84
Alaska	3	4	-	14	10	-	-	-	53
Hawaii	5	11	1	52	51	-	2	-	-
Guam	-	-	-	-	7	-	-	-	-
P.R.	147	186	-	60	63	-	-	-	13
V.I.	1	1	-	3	3	-	-	-	-
Amer. Samoa	-	-	-	-	3	-	-	-	-
C.N.M.I.	-	1	-	-	8	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending April 22, 1989 (16th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	>65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	643	449	118	47	14	15	71
Boston, Mass.	182	121	32	16	8	5	32
Bridgeport, Conn.	33	21	8	3	-	1	2
Cambridge, Mass.	30	25	4	1	-	-	5
Fall River, Mass.	33	28	3	1	-	1	-
Hartford, Conn.	65	42	15	7	-	1	7
Lowell, Mass.	25	15	6	4	-	-	3
Lynn, Mass.	11	8	3	-	-	-	-
New Bedford, Mass.	26	20	6	-	-	-	2
New Haven, Conn.	40	23	11	2	2	2	4
Providence, R.I.	38	25	7	3	-	3	4
Somerville, Mass.	7	6	1	-	-	-	1
Springfield, Mass.	55	40	5	6	3	1	4
Waterbury, Conn.	34	26	6	2	-	-	3
Worcester, Mass.	64	49	11	2	1	1	4
MID. ATLANTIC	3,309	2,130	661	338	81	98	220
Albany, N.Y.	40	29	6	3	-	2	-
Allentown, Pa.	24	14	9	1	-	-	2
Buffalo, N.Y.	100	70	20	6	1	3	6
Camden, N.J.	40	23	10	2	1	4	3
Elizabeth, N.J.	34	25	5	2	2	-	3
Erie, Pa.†	48	44	3	-	-	1	6
Jersey City, N.J.	65	41	15	5	3	1	3
N.Y. City, N.Y.	1,455	889	301	189	29	47	83
Newark, N.J.	107	50	25	23	5	4	10
Paterson, N.J.	17	10	6	1	-	-	-
Philadelphia, Pa.	917	586	190	87	35	16	62
Pittsburgh, Pa.†	67	39	15	4	2	7	4
Reading, Pa.	27	20	4	1	1	1	4
Rochester, N.Y.	138	104	24	4	1	5	12
Schenectady, N.Y.	36	31	3	1	-	1	8
Scranton, Pa.†	27	22	4	1	-	-	1
Syracuse, N.Y.	78	58	11	4	1	4	2
Trenton, N.J.	38	29	5	2	-	2	2
Utica, N.Y.	17	13	3	1	-	-	-
Yonkers, N.Y.	34	31	2	1	-	-	9
E.N. CENTRAL	2,312	1,531	456	170	62	93	113
Akron, Ohio	58	35	14	5	3	1	-
Canton, Ohio	40	29	8	4	-	-	1
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	76	52	15	6	1	2	13
Cleveland, Ohio	152	93	38	11	3	7	6
Columbus, Ohio	169	106	32	17	9	5	1
Dayton, Ohio	117	81	29	3	3	1	7
Detroit, Mich.	250	133	54	35	12	16	7
Evansville, Ind.	47	36	7	3	-	1	3
Fort Wayne, Ind.	55	40	10	3	2	-	3
Gary, Ind.	17	7	3	3	4	-	3
Grand Rapids, Mich.	73	49	16	4	-	4	4
Indianapolis, Ind.	165	111	27	12	3	12	-
Madison, Wis.	52	38	7	3	2	4	3
Milwaukee, Wis.	140	111	17	5	-	7	13
Peoria, Ill.	51	38	7	-	2	4	8
Rockford, Ill.	57	41	9	2	4	1	7
South Bend, Ind.	59	40	18	1	-	-	3
Toledo, Ohio	99	76	13	5	2	3	8
Youngstown, Ohio	71	56	7	3	2	3	7
W.N. CENTRAL	758	568	121	37	13	19	37
Des Moines, Iowa	70	45	18	3	1	3	3
Duluth, Minn.	24	18	4	1	1	-	-
Kansas City, Kans.	27	15	7	4	-	1	1
Kansas City, Mo.	138	97	26	8	5	2	10
Lincoln, Nebr.	42	32	5	3	2	-	3
Minneapolis, Minn.	167	125	25	7	2	8	5
Omaha, Nebr.	97	74	18	4	1	-	10
St. Louis, Mo.	117	102	7	3	-	5	5
St. Paul, Minn.	61	48	8	4	1	-	-
Wichita, Kans.§	15	12	3	-	-	-	-

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	>65	45-64	25-44	1-24	<1	Total
S. ATLANTIC	1,437	823	306	190	51	67	63
Atlanta, Ga.	183	105	40	21	9	8	2
Baltimore, Md.	329	209	65	34	9	12	19
Charlotte, N.C.	85	54	17	6	5	3	6
Jacksonville, Fla.	117	67	25	15	4	6	8
Miami, Fla.	115	56	28	20	7	4	-
Norfolk, Va.	58	35	15	5	1	2	3
Richmond, Va.	89	58	19	6	3	3	10
Savannah, Ga.	39	22	9	4	1	3	5
St. Petersburg, Fla.	66	45	12	6	-	3	2
Tampa, Fla.	77	48	13	7	6	3	2
Washington, D.C.	257	111	56	64	6	20	6
Wilmington, Del.	22	13	7	2	-	-	-
E.S. CENTRAL	781	512	177	52	23	17	48
Birmingham, Ala.	123	81	28	7	3	4	5
Chattanooga, Tenn.	63	45	11	4	-	3	8
Knoxville, Tenn.	83	58	14	6	1	4	3
Louisville, Ky.	128	78	36	8	3	3	6
Memphis, Tenn.	154	104	30	11	8	1	15
Mobile, Ala.	43	25	14	1	2	1	2
Montgomery, Ala.	57	43	9	3	2	-	3
Nashville, Tenn.	130	78	35	12	4	1	6
W.S. CENTRAL	1,745	1,093	368	176	56	50	78
Austin, Tex.	51	34	9	5	2	1	2
Baton Rouge, La.	37	22	8	5	1	1	2
Corpus Christi, Tex.	54	37	9	6	2	-	3
Dallas, Tex.	164	101	38	12	4	9	7
El Paso, Tex.	58	42	7	6	2	1	4
Fort Worth, Tex	92	59	20	2	4	7	8
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	78	48	19	3	4	3	10
New Orleans, La.	151	89	33	20	6	3	-
San Antonio, Tex.	184	125	30	16	6	6	8
Shreveport, La.	30	17	9	1	1	2	5
Tulsa, Okla.	112	83	17	11	-	1	11
MOUNTAIN	721	467	136	65	29	24	42
Albuquerque, N. Mex.	95	58	11	12	11	3	9
Colo. Springs, Colo.	45	31	7	5	2	-	5
Denver, Colo.	138	86	25	17	3	7	2
Las Vegas, Nev.	121	76	34	6	2	3	11
Ogden, Utah	19	13	1	2	1	2	2
Phoenix, Ariz.	118	78	20	11	6	3	2
Pueblo, Colo.	22	19	3	-	-	-	1
Salt Lake City, Utah	46	26	13	2	2	3	-
Tucson, Ariz.	117	80	22	10	2	3	10
PACIFIC	2,080	1,382	386	196	62	46	154
Berkeley, Calif.	21	12	2	4	-	3	2
Fresno, Calif.	73	59	6	4	2	2	14
Glendale, Calif.	22	16	4	2	-	-	2
Honolulu, Hawaii	89	64	19	2	1	3	17
Long Beach, Calif.	102	69	23	5	3	2	12
Los Angeles Calif.	583	355	113	77	27	3	23
Oakland, Calif.§	94	63	18	9	2	2	5
Pasadena, Calif.	31	22	2	3	-	4	2
Portland, Oreg.	139	98	24	9	2	6	7
Sacramento, Calif.	163	108	36	9	4	6	22
San Diego, Calif.	146	108	15	15	4	4	21
San Francisco, Calif.	165	98	36	26	5	-	4
San Jose, Calif.	177	123	30	13	7	4	14
Seattle, Wash.	167	109	34	14	4	6	-
Spokane, Wash.	59	45	11	2	1	-	5
Tacoma, Wash.	49	33	13	2	-	1	4
TOTAL	13,786††	8,955	2,729	1,271	391	429	826

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Ischemic Heart Disease — Continued

was subdivided for further analysis as follows: acute myocardial infarction (acute MI, ICDA-8 and ICD-9-CM: 410); other acute and subacute forms of IHD (other acute IHD, ICDA-8 and ICD-9-CM: 411); chronic IHD (ICDA-8: 412; ICD-9-CM: 412, 414); and angina pectoris (ICD-8 and ICD-9-CM: 413).

From 1978 to 1979, hospitalization rates for IHD declined by 98 hospitalizations per 100,000 men (9.5% change) and 113 hospitalizations per 100,000 women (15% change) (Figure 1). These declines—the largest single yearly change from 1970 through 1986—coincided with the discontinuation of ICDA-8 and the adoption of ICD-9-CM. As a result of the change in coding systems, many cases that would have been assigned codes 410–414 in ICDA-8 were assigned to ICD-9-CM codes 402 (hypertensive heart disease) and 429.2 (cardiovascular disease, unspecified) (*7*).

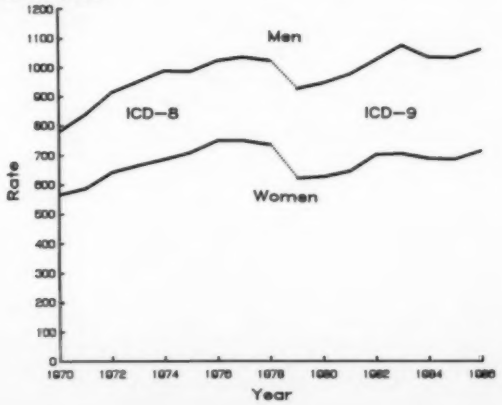
Among men, hospitalization rates per 100,000 ranged from a low of 784 in 1970 to a high of 1066 in 1986; among women, rates ranged from a low of 570 in 1970 to a high of 718 in 1986. If the decrease from 1978 to 1979 is disregarded, the number of hospitalizations per 100,000 men for IHD increased an average of 25 per year from 1970 through 1986. Similarly, the number per 100,000 women for IHD increased an average of 17 per year from 1970 through 1986. The one exception to these trends occurred among men from 1983 to 1984, when the rate declined 39 per 100,000.

From 1970 through 1978, the male-to-female ratio of hospitalization rates was 1.4. The sex ratio of hospitalizations for men was even higher from 1979 through 1986, when it was 1.5.

The changes in hospitalization rates from 1970 through 1986 for IHD obscured important differences among component diseases, in the ratio and difference of hospitalization rates between men and women, and in the pattern of changes over time (Figure 2).

The sex ratio for hospitalization rates varied considerably among the components of IHD and between ICD code periods. Among the component ICD codes of IHD, hospitalization rates for acute MI and chronic IHD were much greater for males than females, a characteristic of IHD as a whole. By contrast, other acute IHD and angina

FIGURE 1. Hospitalization rates per 100,000 persons for ischemic heart disease — United States, 1970–1986



Ischemic Heart Disease – Continued

pectoris showed small differences in hospitalization rates by sex. Differences between sexes were greater for acute MI, other acute IHD, and angina pectoris from 1970 through 1978 than they were from 1979 through 1986; however, for chronic IHD, these differences were greater during 1979–1986.

Excluding changes in 1978–1979 and 1982–1983, rates for acute MI showed small average yearly increases from 1970 through 1986 of 5 hospitalizations per 100,000 men and 3 per 100,000 women. Since 1983, acute MI hospitalization rates have increased slightly among both men and women despite a decrease in overall hospitalization rates (*8*). Beginning in 1985, acute MI replaced chronic IHD as the most common primary diagnosis among persons hospitalized for IHD.[§]

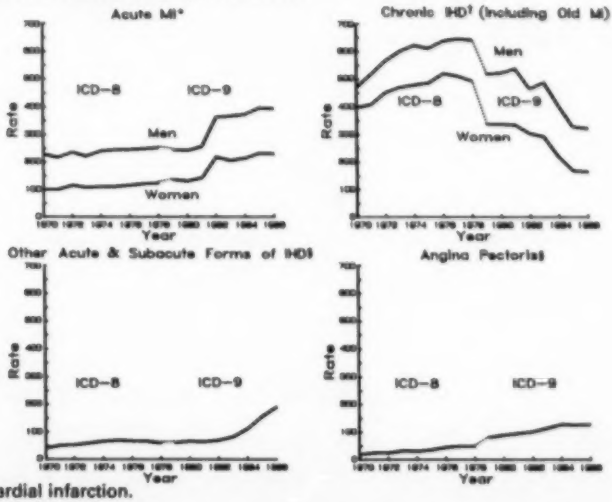
Rates for chronic IHD among both men and women increased through 1976, remained relatively unchanged through 1981, and declined sharply thereafter. From 1981 through 1986, rates declined 40% among men and 50% among women.

Rates for other acute IHD among both men and women were steady through 1982, after which they increased. From 1983 through 1986, hospitalization rates increased 227% among men and 213% among women. For women in 1986, only acute MI exceeded other acute IHD as a first-listed diagnosis among the components of IHD.

Finally, angina pectoris showed very small but consistent average increases of 5 hospitalizations per year from 1970 through 1986. Although angina pectoris remains

[§]As of 1982, NCHS coded acute MI as a first-listed diagnosis whenever it appeared on a hospitalization record with other circulatory diseases and was other than the first entry (*9*). Thus, the striking increase from 1981 to 1982 in hospitalization rates for acute MI among both men and women resulted from a change in editing procedure by NCHS. Because the original first diagnosis was probably a circulatory condition, the decrease for chronic IHD from 1981 to 1982 also may have been caused by this change.

FIGURE 2. Hospitalization rates per 100,000 persons for components of ischemic heart disease – United States, 1970–1986



*MI = Myocardial infarction.
†IHD = Ischemic heart disease.
§Hospitalizations include both men and women because rates by sex are similar.

Ischemic Heart Disease — Continued

the least frequent diagnosis among the IHDs reviewed here, its rate has increased 266% among men and 439% among women over this period (disregarding the change in coding between 1978 and 1979).

Reported by: Office of Surveillance and Analysis, Center for Chronic Disease Prevention and Health Promotion; Hospital Care Statistics Br, Div of Health Care Statistics, National Center for Health Statistics, CDC.

Editorial Note: Hospitalization rates reflect a variety of influences and often do not correspond to incidence or mortality rates in magnitude or trend (*10*).

Sex differentials in hospitalization rates for acute MI and chronic IHD are consistent with the incidence and mortality of IHD in general. By contrast, the data show few or no sex differentials in hospitalization rates for other acute IHD and angina pectoris. The lack of a sex differential for these conditions may reflect health-care use differences between men and women for conditions less life-threatening than acute MI, thereby obscuring a real difference in incidence.

Although IHD-associated mortality declined by 20% between 1968 and 1986 (*11*), hospitalization rates for IHD have increased overall since 1970. The introduction of a prospective payment system based on diagnosis related groups (DRGs) may have influenced hospitalization rates after 1983 (*12*). Changes in hospital use patterns as well as substantial progress in medical technology increased hospitalization rates for IHD while IHD mortality has declined dramatically (*13*). Finally, improved survival from bypass surgery among patients with stenosis of the left main coronary artery may have resulted in increased admissions of patients suspected to be at risk for coronary events or advanced disease (*14–16*).

The continued increasing hospitalization rate for acute MI and the decreasing rate for chronic IHD after 1983 may be related to DRGs. If diagnoses are recorded to maximize hospital reimbursement, then greater specification of diagnosis might be expected. A large decrease in the DRG for atherosclerosis (age >69 years and/or complications or comorbidity) may be associated with increases in three related groups (*17*). However, a change in coding practices probably does not entirely explain the trends observed for hospitalization for IHD.

In the absence of an overall surveillance system for IHD incidence, it is unclear to what extent mortality declines represent a true decrease in risk and/or improvements in medical care. The observed increase in hospitalization for acute IHD may be a manifestation of improving care or may be related to other features of the health-care system. The ultimate answer, which requires further investigation, will have important policy implications for cardiovascular disease prevention and control.

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Ischemic Heart Disease — Continued

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Notice to Readers

Fourth National Conference on Chronic Disease Prevention and Control

CDC and the Association of State and Territorial Health Officials will cosponsor the Fourth National Conference on Chronic Disease Prevention and Control: *Implementing Effective Strategies,* September 20–22, 1989, at the Bahia Hotel in San Diego. The conference is open to the public; registration is free.

The conference will build on the strategies identified by the participants at the three previous conferences and will emphasize the interactions among federal, state, and local health departments, voluntary health agencies, professional organizations, and others. The 1989 conference will include plenary sessions that address legislation, surveillance, and year 2000 health objectives. Seven concurrent sessions will focus on screening and quality assurance; evaluation; diabetes and obesity; childhood antecedents of chronic disease; emerging issues, programs, and controversies in chronic disease prevention and control; barriers to risk-factor modification among minorities; and nutrition and cancer.

Additional information is available from Center for Chronic Disease Prevention and Health Promotion, Mailstop C07, CDC, Atlanta, GA 30333; telephone: (404) 639-2249 or FTS 236-2249.

Progress in Chronic Disease Prevention

Chronic Disease Reports: Coronary Heart Disease Mortality — United States, 1986

Coronary heart disease (CHD) (*International Classification of Diseases, Ninth Revision, Clinical Modification*, rubrics 410–414, 429.2) accounted for 28% of the 2.1 million U.S. deaths in 1986; 0.2% of the U.S. population died from this cause. Age-adjusted rates varied markedly among states, from a low in Hawaii (166/100,000) to a high in New York (303/100,000) (Figure 1, Table 1). Rates were generally highest in the east and lowest in the west.

Many alterable risk factors for CHD exist (Table 2). Several are interdependent, and many persons have multiple risk factors. While diabetes is relatively uncommon, smoking, elevated blood pressure, elevated cholesterol, overweight, and inactivity are common at levels known to increase risk of CHD. CHD mortality has declined substantially in recent years (*1*). Public health interventions to reduce the prevalence of CHD risk factors may further reduce CHD mortality in the U.S. population.

Reported by: Div of Surveillance and Epidemiologic Studies, Epidemiology Program Office, CDC.

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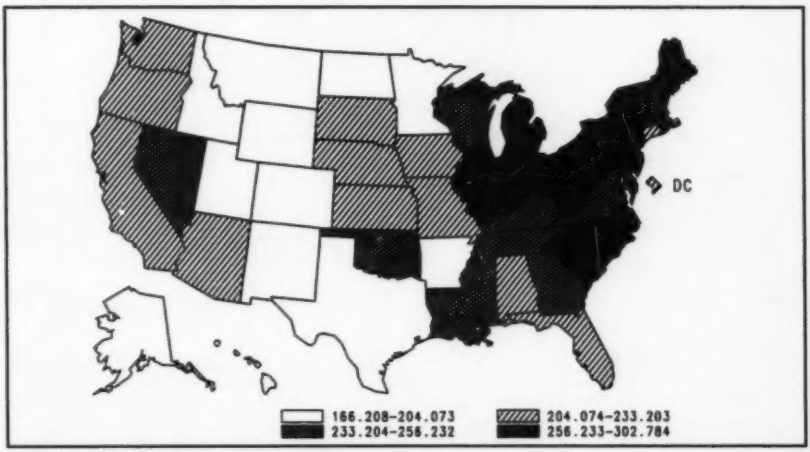
CHRONIC DISEASE REPORTS: CORONARY HEART DISEASE, FIGURE 1. Age-adjusted coronary heart disease mortality rates per 100,000 persons, by quartile — United States, 1986*



*U.S. standard age distribution. See *MMWR* 1989;38:191.

Coronary Heart Disease — Continued

CHRONIC DISEASE REPORTS: CORONARY HEART DISEASE, TABLE 1. Age-adjusted coronary heart disease mortality, by state — United States, 1986

State	Deaths	Rate per 100,000	Rank by rate
Alabama	8,482	212.1	35
Alaska	345	189.7	48
Arizona	6,582	207.1	38
Arkansas	5,500	199.4	42
California	55,673	229.3	29
Colorado	5,091	201.3	41
Connecticut	8,027	228.8	30
Delaware	1,620	271.6	8
District of Columbia	1,349	207.1	37
Florida	37,031	231.2	28
Georgia	11,863	235.3	25
Hawaii	1,403	166.2	51
Idaho	1,708	190.4	47
Illinois	31,666	274.3	5
Indiana	14,039	256.2	13
Iowa	8,172	226.5	31
Kansas	5,979	207.6	36
Kentucky	9,461	254.6	14
Louisiana	8,905	241.1	21
Maine	3,435	257.4	11
Maryland	9,556	247.4	19
Massachusetts	16,178	239.0	23
Michigan	25,666	298.7	2
Minnesota	9,169	198.3	43
Mississippi	6,477	252.9	16
Missouri	13,666	231.8	27
Montana	1,566	195.0	45
Nebraska	3,934	204.1	39
Nevada	1,689	233.2	26
New Hampshire	2,456	240.9	22
New Jersey	22,152	277.9	4
New Mexico	2,150	184.0	50
New York	58,473	302.8	1
North Carolina	15,207	258.4	10
North Dakota	1,413	191.7	46
Ohio	29,796	273.1	6
Oklahoma	8,488	249.3	18
Oregon	6,375	221.0	32
Pennsylvania	36,541	266.8	9
Rhode Island	3,346	283.5	3
South Carolina	7,248	256.6	12
South Dakota	1,860	216.8	33
Tennessee	12,214	254.5	15
Texas	27,396	203.0	40
Utah	2,087	189.3	49
Vermont	1,382	249.8	17
Virginia	11,726	236.5	24
Washington	9,207	215.4	34
West Virginia	5,653	272.9	7
Wisconsin	13,014	245.8	20
Wyoming	695	196.5	44
Total	**593,111**	**246.0**	

Coronary Heart Disease — Continued

CHRONIC DISEASE REPORTS: CORONARY HEART DISEASE, TABLE 2. Coronary heart disease (ICD-9-CM 410–414, 429.2) indices — United States

Measure	No.	Rate per 100,000
Mortality (1986)	593,111	246
Prevalence*	11,193,000	4,692
Hospitalizations†	1,615,320	670
Years of potential life lost before age 65§	1,557,041	646

Risk factor	Prevalence (%)¶	Crude relative risk	Population-attributable risk (%; nonadditive)**	Estimated preventable deaths (nonadditive)††
Smoking (current)	26.5§§	1.7¶¶	15.6	92,525
Hypertension				
(>159 mm Hg)	17.7***	2.9†††	25.2	149,464
(140–159 mm Hg)	12.0***	1.7†††	7.7	45,670
Diabetes	2.8*	2.9§§§	5.1	30,249
Cholesterol				
(≥240 mg/dL)	24.9¶¶¶	3.0****	33.2	196,913
(200–239 mg/dL)	31.1¶¶¶	1.7****	17.9	106,167
High-density lipoprotein				
(<35 mg/dL)	11.2††††	2.4§§§§	13.6	80,663
Inactivity	58.8¶¶¶¶	1.9*****	34.6	205,216
Overweight				
MRW ≥130	26.6†††††	2.0†††††	21.0	124,553
MRW 110–129	41.4†††††	1.5†††††	17.1	101,422

*NCHS. Current estimates from the National Health Interview Survey: United States, 1987. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1988; DHHS publication no. (PHS)88-1594. (Vital and health statistics; series 10, no. 166).

†NCHS. National Hospital Discharge Survey, 1987 [machine-readable public-use data tape] (ICD-9-CM 410, 411, 413, 429.2).

§CDC. Years of potential life lost before age 65 in 1986. MMWR 1989;38:27–9 (ICD-9-CM 390–398, 402, 404–429).

¶Prevalences in different studies and samples of the U.S. population.

**Population-attributable risk (PAR) = percentage of mortality attributable to the specific risk factor. Because persons may be exposed to more than one risk factor, estimated PAR from different risk factors should not be added. CDC. Chronic disease reports in the *Morbidity and Mortality Weekly Report* (*MMWR*). MMWR 1989;38(suppl S-1).

††Estimated preventable deaths = PAR x mortality. Because persons may be exposed to more than one risk factor, estimated preventable deaths from different risk factors should not be added.

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Coronary Heart Disease — Continued

†††Framingham sample, whites 47–74 years of age. Recalculated from Kannel WB, Stokes J III. Hypertension as a cardiovascular risk factor. In: Bulpitt CJ, ed. Handbook of hypertension. Vol 6. Epidemiology of hypertension. New York: Elsevier Science Publishers, 1985.

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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